

## Synopsis of Treatment Plan

### Overview

The treatment plan options for selenium discharges and conductivity discharges primarily employ engineering controls and bioreactor construction. The plan is divided into three phases. When Phase 1 treatment results in compliant discharges, Phase 2 and Phase 3 will not need to be implemented. The Plan focuses on underdrain flow emanating from the valley fill toe where concentrations of selenium and conductivity are generally highest in concentration. Also, segregating underdrain flow from surface flow will lessen the volume of water making treatment more manageable.

Internal monitoring will be implemented employing trend line analysis. This monitoring method will give early indication of the efficacy of treatment employed and allow modifications to be integrated early in the process. Lexington Coal Company LLC (“Lexington”) will employ Lantz G. Rankin of Heritage Technical Associates Inc. (“Heritage”) to oversee implementation of the treatment options (CV enclosed). Heritage has experience in treatment options and will prepare a monthly report, agreed to by Lexington detailing progress made, testing results obtained, next steps being taken, impediments encountered, and outline other relevant issues. This report will be provided to management to assure the treatment plan is being implemented expeditiously and is effective. When regulatory approval is required, Lexington will diligently pursue timely approval of treatment implementation plans. Heritage will provide management with a report summarizing progress and regulatory approval status.

A report will be filed with the Court on a monthly basis summarizing the status of treatment implementation at each outlet and monitoring results with trend line analysis. Additionally, the report will provide estimated labor and expenditures incurred to meet treatment measures taken. An updated Gantt chart will be an integral part of said monthly report submitted to the Court.

### Phase 1 Treatment Plan

Phase 1 will consist of pumping the valley fill underdrain flow to a retention structure built on the upper portion of the previously mined area. Where selenium is the relevant issue, a bioreactor will be employed. Where conductivity is the relevant issue, a holding pond will be constructed. Water from the valley fill under drain will be pumped to the holding pond. The water in the holding pond will be used for irrigation to facilitate success of the approved revegetation plan. Additionally, the water will be used as a dust suppressant and other irrigation needs dependent upon future land uses. During adequate precipitation events, retained water will be gravity fed into the receiving stream with the length of time and amount of flow released dependent upon duration and amount of the precipitation event. Monitoring will occur to assure the receiving stream is trending toward compliance with selenium discharges and

conductivity discharges. A chart will be developed that will be stream specific to determine the volume amount of the discharge release. The chart development will be based on volume and concentration of the parameter in the holding pond and the volume; concentration of the parameter of concern in the stream; and the volume of flow in the stream.

Phase 1 plan recognizes time and duration of water contact with mined strata impacts conductivity and selenium. By focusing on the high concentration of conductivity and selenium at the underdrain, the volume of water needing treatment is segregated and volume is reduced allowing treatment to be manageable. Also, use of retained water will facilitate reclamation, thereby reducing contact of rainwater from barren soil and rock. Discharging water into the receiving stream during rainfall events allows dilution to further reduce concentration.

**NPDES Modification No. 12/WV1020579** has been submitted and approved in order to construct three bio-chemical reactors to treat elevated selenium levels. The bio-chemical reactors will be located within the existing permit boundary. Associated Revision 16 for Article 3 permit S-5015-01 has been submitted and approved for the bio-chemical reactors construction. (See Attachment A.)

The East Bio-Chemical Reactor System (East BCR) has been constructed near the back of Valley Fill No. 4. The East BCR will be activated on or before November 30th 2022 utilizing molasses powder as a nutritional boost. The East BCR will treat water from Pond No. 4 (Outlet 031). Water will be pumped from Pond No. 4 at a maximum pump rate of 1000 gpm through HDPE Pipe up to the BCR for treatment. The water will then be pumped and/or gravity fed through HDPE Pipe back to Outlet 031 and outleted into the receiving stream to replenish the stream with treated water. Instream Monitoring Outlet 031BR will be added under NPDES Modification No. 12 to monitor the BCR System performance. During initial startup of the BCR System water may need to be temporarily diverted to nearby on-bench Pond 31.1 due to the treated water's cloudiness. After the treated water cloudiness is gone treated water will be discharged at the various outlets by design.

The North Bio-Chemical Reactor System (North BCR) will be constructed at the back of Valley Fill No. 1. Construction will be initiated on or before September 30, 2022. Construction will be completed by November 30, 2022. The North BCR will treat water from Pond No. 1 (Outlet 005), Pond No. 6 (Outlet 012), Sediment Ditch 61, and Sediment Ditch 62 (Outlet 062). Water from Sediment Ditch 61 and 62 will be pumped from Outlet 062 at maximum pump rate of 40 gpm (0.02 cfs) through HDPE Pipe and discharge to groin ditch GR-6.6 of Valley Fill No. 1. This pumped water from Sediment Ditch 61 & 62 will flow down to Pond No. 1A and Pond No. 1 where it will be pumped to the North BCR for treatment. Water will be pumped from Pond No. 1 at a maximum pump rate of 1000 gpm and from Pond 6 at a maximum pump rate of 850 gpm through HDPE Pipe up to the BCR for treatment. The water will then be pumped and/or gravity fed through HDPE Pipe back to outlets 005 and 012 and outleted into the receiving stream to replenish the stream with treated water. Instream Monitoring Outlets 005BR and 012BR will be

added under NPDES Modification No. 12 to monitor the BCR System performance. During initial startup, molasses powder will be added to the BCR System and water may need to be temporarily diverted to nearby on-bench Pond 6.1 due to the treated water's cloudiness. After the treated water cloudiness is gone treated water will be discharged at the various outlets by design.

The South Bio-Chemical Reactor System (South BCR) will be constructed at the back of Valley Fill No. 2. Construction will be initiated on or before September 30, 2022. To complete final construction, a mixed organic media containing any or all of the following; hay, sawdust, woodchips, mushroom compost, limestone chips, and molasses powder, must be sourced. Sourcing organic material for the South Bio-Chemical Reactor System will be completed by December 30, 2022. The South BCR will treat water from Pond No. 2 (Outlet 047) and Pond No. (Outlet 045). Water will be pumped from Pond No. 2 at a maximum pump rate of 1300 gpm and from Pond 3 at a maximum pump rate of 1150 gpm through HDPE Pipe up to the BCR for treatment. The water will then be pumped and/or gravity fed through HDPE Pipe back to Outlet 047 and outleted into the receiving stream to replenish the stream with treated water.

Instream Monitoring Outlet 047BR will be added under NPDES Modification No. 12 to monitor the BCR System performance. During initial startup of the BCR System water may need to be temporarily diverted to nearby on-bench Pond 47.1 due to the treated water's cloudiness. After the treated water cloudiness is gone treated water will be discharged at the various outlets by design.

The bio-reactor systems will consist of an equalization basin, two or three parallel bio-reactors, one aeration pond, and one polishing pond. North BCR and East BCR will have two parallel bio-reactors while South BCR will have three parallel bio-reactors. Water will be collected and gravity fed or pumped from the various locations to the equalization basin, which will distribute the flow into the parallel bio-reactors with the treated water entering the aeration pond then polishing pond. From the polishing pond, the water will be diverted by pumping or gravity fed to the various outlets prior to discharging into the receiving stream.

During initial startup of the BCR Systems water may need to be temporarily diverted to nearby on-bench ponds due to the treated water's cloudiness. After the treated water cloudiness is gone treated water will be discharged at the various outlets by design. The bio-reactor systems will be lined with either 40 mil LLDPE or a Geosynthetic Clay Liner. See the detail drawings for the bio-reactor systems. (Attachment \_)

The BCR's are located on top the surface mine regrade as to prevent surface water runoff infiltration into them. The BCR's will also have a minimum 2 ft tall by 5 ft wide berm around each BCR component to prevent surface water runoff infiltration. Emergency spillways have been designed for the BCR systems. Spillways are designed based on

the total maximum pumping/gravity feed inflow combined with a 25 year 24 hour storm event from direct rainfall infiltration into the largest BCR System cell. A trapezoidal spillway having a 10ft crest length, 2:1 (H:V) side slope ratio, headwater elevation of 0.5 ft and 1 ft of freeboard with a maximum design discharge of 15.01 cfs was used.. Maintenance for the bio-reactor systems will occur as needed. Any material removed from the bio-reactor will be treated as material requiring special handling and will be placed in encapsulation cells as per existing permit requirements. The bio-reactor system will be abandoned when no longer needed.

The biochemical reactor cells have been designed in order to reduce the amount of selenium concentrations in the existing discharges mentioned above. The Biochemical Reactor Cells will consist of surface feed piping and bottom discharge piping to create a vertical (downward) and horizontal flow of water through the cell. The cell is lined to prevent migration of water into, or out of the cell. Cell components will consist of a gravel layer on the bottom that serves as a fixed bed attached growth media for microbial processes and a principle flow pathway.

The media layer consists of a mixed organic media containing any or all of the following; hay, sawdust, woodchips, mushroom compost, limestone chips, and molasses powder. The height of the water within the BCR is controlled by an outlet structure that allows for varying the height of water within the cell. Under normal operating conditions there will be no free standing water within the bio-reactor cells. The water level will be just below the top of the mixed media in the bio-reactor cell.

The BCR Systems should not affect the overall flow pattern of the surrounding area or the currently approved SWROA for the associated permit. During mining flow conditions should not be increased as a result of the BCR Systems being constructed. The BCR Systems will not alter the flow patterns in the current drainage areas to affect the sediment control structures. The BCR Systems are constructed high and dry to divert water around the BCR components.

Four instream monitoring sites will be added to determine the water quality from the BCR systems. These will be added once the corresponding BCR has been activated. The North BCR system will add monitoring site 005BR and 012BR; South BCR system will add 047BR; East BCR system will add 031BR. Outlet 061 has been closed off and the drainage from Sediment Ditch 61 has been directed toward Sediment Ditch 62 and Outlet 62.

At the **Low Gap Surface Mine WV1016288** Outlets 002 (Pond #10), 024 (Pond #2), and 017 (Pond #1) has had noncompliant selenium discharges. To treat these flow from these three outlets, Lexington proposes to pump previously treated water from the Western Bio-Chemical Reactor (BCR) system at Premium Energy's No. 2 Surface Mine and treat selenium discharges at the following locations/outlets:

- Pond No. 2 (Outlet 024) and Pond No.10 (Outlet 002), both on this permit (Low Gap Surface Mine No. 2)
- Pond No. 2-88 on this (Low Gap Surface Mine No. 2) permit. Discharges from this pond containing the BCR water will flow via existing and bonded channels to Pond No. 1 (Outlet 017).
- Pond No. 4 (Outlet 019) on the Ben Creek No. 1 Surface Mine, permit S504988.
- The existing wet-seal on the Ridge Alma C Deep Mine U500498 (Outlet 059) will be gravity fed down to the existing road ditch on the Ben Creek No.1 Surface Mine S504988 from there it will flow into Pond No. 4 (Outlet 019).

This will necessitate the addition of BR outlets at 002, 017 019 and 024.

A Module 1R is included in the NPDES application proposing a modification to receive the drainage from Premium Energy, LLC Bio-Chemical Reactor at outlets 002, 017, 019, and 024.

The BCR discharge will be pumped through a proposed 10” HDPE line to a collection pond as shown on the attached Proposal and Drainage map. In-route to the collection pond, “tee’s” will be installed that provide treated water to Pond No. 2-88 and to the road ditch that feeds into Pond No. 4. permit S504988 un-permitted surface area. The IBR application added this area to the permit. The area will be 600 feet by 25 feet wide, or 0.35 acres added.

## **Phase 2 Treatment Plan**

Phase 2 will be implemented only if Phase 1 implementation does not achieve compliant discharge. Evaluation will be performed to determine the efficacy of releasing flow from the retention structure built during Phase 1 by releasing water into a larger watershed with higher flow, greater dilution capacity and lower base flows of conductivity and selenium. This mixing zone will require regulatory approval.

Additionally, Lexington will evaluate underground injection potential into abandoned mines where outcrop barrier conditions and mine dip considerations are favorable.

### **Phase 3 Treatment Plan**

Phase 3 will be used if Phase 1 and Phase 2 implementation does not result in compliance requirements for Selenium and Conductivity. Phase 3 would employ diverting some mine area drainage away from the valley fill to on-bench outlets. Additionally compaction standards would be employed - 90% proctor- on the top two feet of the valley fill to reduce infiltration during precipitation events. Re-vegetation would be employed with a quick growth temporary ground cover as an interim measure while permanent vegetation is being established.

### **Summary**

The treatment plans proposed employing engineering controls that can be timely implemented and uses skills and equipment readily available to Lexington. Monitoring allows for trend line analyses that will indicate when to employ next steps. Cost Analysis Reporting confirms due diligence the company is taking to remediate current parameter exceedances. The attached Action Treatment Plan Summary is feasible and can timely be implemented to bring discharge into permit compliance.

NPDES Permit Numbers	Outlets	Treatment	Phase	Monitoring	Criteria Numeric	Construction Status	Rationale
<b><i>WV 1016288</i></b> <b><i>and</i></b> <b><i>WV 1020579</i></b>	Any out of compliance outlets for selenium and/ or conductivity	<p>The non-compliant water will be pumped to a retention pond and pumped from the retention pond for various uses at the mining site: irrigation for re-vegetation; dust suppression; etc.</p> <p>Sites with bioreactors in place will maintain enough flow through the bioreactors to keep the bioreactors active.</p>	Overall	<p>Monitoring will be maintained according to the current monitoring required by the NPDES permit.</p> <p>Internal Only Monitoring will be required when there is flow through said outlet.</p>	<p>The criteria for selenium will remain as listed in the permits. NPDES permits 8 mg/kg Fish tissue limit in NPDES permits. Internal monitoring only will test in the pond for the bioreactor prior to the discharge point and in each cell of the bioreactor.</p> <p>EPA Guidance (April 1, 2010), suggested 300 microsiemens per centimeter (<math>\mu\text{S}/\text{cm}</math>) to protect aquatic life under "narrative" water quality standards.</p> <p>The goal of the Internal Monitoring monitoring will utilize a sampling point in the middle of the receiving stream approximately 100 feet downstream from the discharge point. Internal monitoring will begin thirty days after initiation of under drain pumping at each outlet. Success criteria would be a trend line analysis using a rolling 12-month average of samples trending toward a 300 microsiemens per</p>	<p>Construction began immediately on structures not requiring approval of WVDEP or other regulators. Construction would begin immediately after required approval is received.</p> <p>The following timeline for WV1016288 Outlets 002, 017, 019 and 024 and WV1020579 Outlets 005,012, 031, 045 and 047 are applicable to all plans utilizing underdrain pumping . Applications for any necessary regulatory approvals will be begin immediately and applications will be no later than December 1, 2022. Locating a source for purchase of pumps will begin immediately. All pumps for pumping the fill underdrains will be purchased no later than January 31, 2023.</p> <p>Construction of all ponds necessary for installation of the under drain pumps will be constructed no</p>	<p>Accepted engineering practices provides segregation of high concentrations of selenium and conductivity. Release of higher concentrations pollutants during precipitation events into receiving will provide dilution.</p>

					<p>centimeter (<math>\mu\text{S}/\text{cm}</math>) with a final goal of protecting the narrative water quality standard with a reduction in ionic pollution. The BCR may need to be adjusted for optimal performance on or before March 30, 2023. If final compliance cannot be met on or before June 2023. If , after adjustment there is more adjustment required , Phase 2 will be implemented. Phase 2 will also be implemented if the sample results are not trending for compliance for 3 monthly samples in a row.</p> <p>Sampling would be done monthly.</p> <p>Hereinafter referred to in this Plan as “General Monitoring Criteria”.</p>	<p>later than January 31, 2023.</p> <p>The underdrain pumps will be activated immediately upon installation of the pups and the infrastructure required such as pipes, retention ponds, etc, no later than January 31, 2023.</p> <p>The pumping system may need to be adjusted according to volume of flow or other factors. If required, this will be performed no later than March 30, 2023.</p> <p>Compliance with final narrative water quality standards will be achieved on or before September 1, 2023.</p> <p>A Report will be made monthly on the status of construction of the pumping systems at each outlet included in this phase of the Plan.</p> <p>Construction status and timelines for specific outlets with BCRs are detailed within the chart.</p> <p>Hereinafter referred to in this Plan as “General Pumping Timeline”.</p>	
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<b>WV 1016288</b>	<p>Outlet 19 and Outlet 59 Selenium and Conductivity</p> <p>The existing wet-seal on the Ridge Alma C Deep Mine U500498 (Outlet 059) will be gravity fed down to the existing road ditch on the Ben Creek No.1 Surface Mine S504988 and from there it will flow into Pond No. 4 (Outlet 019).</p>	<p>1<sup>st</sup> Bioreactor Water Management</p>	1	<p>NPDES Bi- Monthly monitoring as specified in the NPDES permit.</p> <p>Internal Only Trendline Monitoring will utilize a 12- month rolling average The sampling will be at a location before the NPDES sampling point with additional samples at bioreactor entry and entry and exit to each cell if more than one cell per bioreactor constructed. Internal monitoring will begin for each BCR 30 days after activation for BCR</p>	See General Monitoring Criteria.	<p>The Biochemical Reactor System approved as a part of Permit WV1016288 Modification 28 associated with S-4013-95 IBR 7 to treat water from Outlet No. 019 and Outlet 59 on WV 1016288 has been approved and Earthwork has been completed on or before September 6, 2022. Sourcing of a mixed organic media containing any or all of the following; hay, sawdust, woodchips, mushroom compost, limestone chips, and molasses powder, must be sourced on or before October 15, 2022. This BRC will be activated on or before December 15, 2022 to address selenium issues at Outlet 019 and Outlet 59. This BCR is designed to treat water from Pond 4 (Outlet 019) and the wet seal Ben Creek No.1 Surface Mine S504988 (Outlet 059). The water from Pond 4 will be pumped to this BCR, treated then returned via pumping/gravity flow to</p>	<p>Proven Technology –</p> <p>Bioreactors have been constructed at many mining sites. WVDEP developed criteria for bioreactors in 2013. The West Virginia Department of Environmental Protection (DEP) finds that these structures can be successful in reducing the concentrations of the pollutants for which they are designed.” Permitting Guidance for Bioreactors Series 23 of the I&amp;E Handbook</p>

						<p>Pond 4 so that the hydraulics of the stream will remain the same. This BCR will be activated on or before December 15, 2022 utilizing molasses powder in the medium as a nutritional boost to jump start the bioreactor process.</p> <p>Compliance with final selenium limits is expected no later than September 1, 2023.</p> <p>The BCR treated water will be aerated and polished in a Pond to maintain compliance with downstream water quality monitored at Instream Monitoring Point 19BR.</p> <p>In order to address conductivity, prior to pumping to this BCR the underdrain will be segregated and pumped to a retention pond. Earth work associated with the retention pond will be initiated on or before September 10, 2022 and completed on or before January 31, 2023. The water from the retention pond will be pumped to provide</p>	
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						<p>irrigation for revegetation, dust suppression, etc. The pump would be sourced and activated on or before January 31, 2023 January 31, 2023.</p> <p>Compliance with final narrative water quality standards will be achieved on or before September 1, 2023.</p> <p>Additional monitoring at 31BR will be initiated for pH, DO, COD, BOU, TSS, NO-3, NO-2 NH3-N</p>	
<b>WV 1016288</b>	Outlet 17	Bioreactor	1	NPDES Bi- Monthly monitoring as specified in the NPDES permit.	See General Monitoring Criteria.	Biochemical Reactor System approved as a	

	Selenium and Conductivity	Water Management		<p>Internal Only Trendline Monitoring will utilize a 12- month rolling average end of pipe with additional samples at bioreactor entry and exit to each cell if more than one cell per bioreactor constructed.</p>	<p>See General Monitoring Criteria.</p> <p>The criteria for selenium will remain as listed in the permits. NPDES permits 8 mg/kg Fish tissue limit in NPDES permits. Internal monitoring only will test end of pipe for the bioreactor and in each cell of the bioreactor.</p> <p>EPA Guidance (April 1, 2010), suggested 300 microsiemens per centimeter (<math>\mu\text{S}/\text{cm}</math>) protect aquatic life under "narrative" water quality standards.</p> <p>The goal of the Internal Monitoring will utilize a sampling point in the middle of the receiving stream approximately 100 feet downstream from the discharge point. Internal monitoring will begin thirty days after initiation of under drain pumping at each outlet. Success criteria would be a trend line analysis using a rolling 12- month average of samples trending toward a 300 microsiemens per centimeter (<math>\mu\text{S}/\text{cm}</math>) with a final goal of protecting the narrative water quality standard with a reduction in</p>	<p>part of Permit WV1016288 Modification 28 associated with S-4013-95 IBR 7 to treat water from Outlet No. 017 on WV 1016288 has been approved. Earthwork will completed on or before October 30, 2022. Sourcing of a mixed organic media containing any or all of the following; hay, sawdust, woodchips, mushroom compost, limestone chips, and molasses powder, must be sourced on or by December 15, 2022. The This BRC will be activated on or before January 31<sup>st</sup> 2023 to address selenium issues at Outlet 017 This BCR is designed to treat water from Pond 1(Outlet 017). The water from Pond 1 will be pumped to the this BCR, treated then returned via pumping/gravity flow to Pond 1 so that the hydraulics of the stream will remain the same. Activation on January 31<sup>st</sup> 2023 of this BCR utilizing molasses powder in the medium as a nutritional boost to</p>	
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					<p>ionic pollution. If final compliance cannot be met on or before September 2023. The BCR may need to be adjusted for optimal performance on or before March 30, 2023. If , after adjustment there is more adjustment required , Phase 2 will be implemented. Phase 2 will also be implemented if the samples are trending the wrong way for 3 monthly samples in a row.</p> <p>Sampling would be done monthly..</p>	<p>jump start the bioreactor process.</p> <p>The BCR treated water will be aerated and polished in a Pond to maintain compliance with downstream water quality monitored at Instream Monitoring Point 17BR.</p> <p>Compliance with final selenium limits is expected no later than September 1, 2023.</p> <p>In order to address conductivity, prior to pumping to the BCR, the underdrain will be segregated and pumped to a retention pond. Earth work associated with the retention pond will be initiated on or before October 31, 2022 and completed on or before January 31, 2023. The water from the retention pond will be pumped to provide irrigation for revegetation, dust suppression, etc. The pump would be sourced on or before December 10, 2022.</p> <p>Compliance with final narrative water quality standards will be</p>	
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						<p>achiever on or before September 1, 2023.</p> <p>Additional monitoring at 31BR will be initiated for pH, DO, COD, BOU, TSS, NO-3, NO-2 NH3-N</p>	
<b>WV 1016288</b>	Outlet 24 and Outlet 002	Bioreactor Water Management	1		See General Monitoring Criteria.	<p>Biochemical Reactor System approved as a part of Permit WV1016288 Modification 28 associated with S-4013-95 IBR 7 to treat water from Outlets No. 24 and 002 on WV 1016288 has been approved.</p> <p>Earthwork completed on or before September 6, 2022. Sourcing of a mixed organic media containing any or all of the following; hay, sawdust, woodchips, mushroom compost, limestone chips, and molasses powder, will be sourced on or by October 31, 2022 . This BRC will be activated or before January 31, 2023 to address selenium issues at Outlet 024 and Outlet 002. This BCR is designed to treat water from Pond 2 (Outlet 024</p>	

						<p>and Pond 10 (Outlet 002)  The water from Ponds 2 and 10 will be pumped to the this BCR, treated then returned via pumping/gravity flow to Ponds 2 and 10 so that the hydraulics of the stream will remain the same. The this BRC will be activated on or before January 31, 2023 utilizing molasses powder in the medium as a nutritional boost to jump start the bioreactor process.</p> <p>The BCR treated water will be aerated and polished in a Pond to maintain compliance with downstream water quality monitored at Instream Monitoring Points 24BR and BR002.</p> <p>Compliance with final selenium limits is expected no later than September 1, 2023.</p> <p>In order to address conductivity, prior to pumping to this BRS, the underdrain will be segregated and pumped to a retention pond. Earth work associated with the retention pond will be completed on or</p>	
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						<p>before January 1, 2023. The water from the retention pond will be pumped to provide irrigation for revegetation, dust suppression, etc. The pump would be sourced on or before January 31, 2023.</p> <p>Compliance with final narrative water quality standards will be achieved on or before September 1, 2023.</p> <p>Additional monitoring at 31BR will be initiated for pH, DO, COD, BOU, TSS, NO-3, NO-2 NH3-N</p>	
<b>WV 1016288</b>	<p>Outlet 002, 017, 024, 059, and 019 060 Selenium Conductivity</p> <p>Water management (pumping) will address both selenium and conductivity. A BCR unit has been constructed for Outlet 19 in addition to</p>	Utilizing a retention pond, Hold non-compliant water Release water in higher precipitation events	1	<p>NPDES Bi- Monthly monitoring as specified in the NPDES permit.</p> <p>Internal Only Trendline Monitoring will utilize a 12- month rolling average end of pipe sampling and sampling at a point approximately 100 feet downstream.</p>	See General Monitoring Criteria.	<p>See General Pumping Timeline.</p> <p>Compliance with final narrative water quality standards will be achieved on or before September 1, 2023.</p>	<p>Dilution</p> <p>If needed. If not needed Phase 2 won't be implemented.</p>



	water management.						
<b>WV 1016288</b>	Outlet 002, 017, 024,059, 060, and 019  Selenium and Conductivity	Release retained pond water into mixing zone stream	2***	NPDES Bi- Monthly monitoring as specified in the NPDES permit.	See General Monitoring Criteria.	Internal Only Trendline Monitoring will utilize a 12- month rolling average pond samples with additional samples 100 feet below the discharge point.  Compliance with final narrative water quality standards will be achieved on or before September 1, 2023.	West Virginia Department of Environmental Protection allows Mixing Zones. See Water Quality Standards/ Mixing Zones Implemental Guidance
<b>WV 1016288</b>	Outlet 002, 017, 024,059, 060, and 019  Selenium and Conductivity	Release Retention pond water into mixing zone stream	2**	NPDES Bi- Monthly monitoring as specified in the NPDES permit.  Internal Only Trendline Monitoring will utilize a 12- month rolling average end of pipe sampling and sampling at a point approximately 100 feet downstream.	See General Monitoring Criteria.	Internal Only Trendline Monitoring will utilize a 12- month rolling average in-stream samples 100 feet below the discharge point.  Compliance with final narrative water quality standards will be achieved on or before September 1, 2023.	West Virginia Department of Environmental Protection allows Mixing Zones. See Water Quality Standards/ Mixing Zones Implemental Guidance
<b>WV 1016288</b>	Outlet 002, 017, 024,059, 060, and 019  Selenium and Conductivity	Diversion of surface water away from fill	3***	NPDES Bi- Monthly monitoring as specified in the NPDES permit.  Internal Only Trendline Monitoring will utilize a 12- month rolling average end of pipe	See General Monitoring Criteria.		Diverting surface water away from fill will reduce contact time.

				sampling and sampling at a point approximately 100 feet downstream.			
<b>WV 1016288</b>	Outlet 002, 017, 024,059, 060, and 019  Selenium and Conductivity	Compaction  Compact the top 2 foot fill layer to 90% proctor.	3** *	NPDES Bi- Monthly monitoring as specified in the NPDES permit.  Internal Only Trendline Monitoring will utilize a 12- month rolling average end of pipe sampling and sampling at a point approximately 100 feet downstream.	See General Monitoring Criteria.	Phase 3 will be considered if Phase 2's Trendline analysis is not a success	(If needed.)  Compaction of the top layer of material reduces infiltration of the fill.
<b>WV 1016288</b>	Outlet 002, 017, 024,059, and 019 060  Selenium Conductivity	Underground Injection	3***	NPDES Bi- Monthly monitoring as specified in the NPDES permit.  Sample water to be injected at the point of underground entry.	No surface flow to monitor because it should not discharge. If it discharges it will be monitored according to the NPDES permit.	Phase 3 will be considered if Phase 2's Trendline analysis is not a success	(If needed.)
<b>WV1016288</b>	Outlet 060	Based on the Draft NPDES Permit and current DMRs Outlet O60 is not a reportable Outlet.  (See Attachment)					
<b>WV 1020579</b>	Outlet031 Selenium and Conductivity  Water management (pumping) will address both selenium and	Bioreactor  Water management	1	NPDES Bi- Monthly monitoring as specified in the NPDES permit.  Internal Only Trendline Monitoring will utilize a 12- month rolling average end of pipe sampling and sampling	See General Monitoring Criteria.	The East Biochemical Reactor System modified and approved in Modification 12 associated with Revision 16 as a part of Permit WV 1020579 for Outlet No. 031. The East	Proven Technology  Bioreactors have been constructed at many mining sites. WVDEP developed criteria for

	conductivity. A BCR unit has been constructed for Outlet 31 in addition to water management.			at a point approximately 100 feet downstream.		<p>Biochemical Reactor System ("East BRS") has been constructed at the back of Fill 4 and is designed to treat water from Pond 4 (Outlet 31).</p> <p>WVDEP approval has been received and Earthwork has been completed on or before September 6, 2022. Sourcing of a mixed organic media containing any or all of the following; hay, sawdust, woodchips, mushroom compost, limestone chips, and molasses powder, will be sourced on or by October 31, 2022. The East BRC will be activated or before November 31, 2023 to address selenium issues at Outlet 031. This BCR is designed to treat water from Pond 4 (Outlet 031)) The water from Pond 4 will be pumped to the East BCR, treated then returned via pumping/gravity flow to Pond 4 so that the hydraulics of the stream will remain the same. The East BRC will be activated on or before November 31, 2022 utilizing molasses</p>	<p>bioreactors in 2013."The West Virginia Department of Environmental Protection (DEP) finds that these structures can be successful in reducing the concentrations of the pollutants for which they are designed." Permitting Guidance for Bioreactors Series 23 of the I&amp;E Handbook</p>
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						<p>powder in the medium as a nutritional boost to jump start the bioreactor process.</p> <p>The BCR treated water will be aerated and polished in a Pond to maintain compliance with downstream water quality monitored at Instream Monitoring Points 24BR and BR002.</p> <p>Compliance with final selenium limits is expected no later than September 1, 2023.</p> <p>In order to address conductivity, prior to pumping to the East BRC, the underdrain will be segregated and pumped to a retention pond. Earth work associated with the retention pond will be completed on or before December 31, 2022. The water from the retention pond will be pumped to provide irrigation for revegetation, dust suppression, etc. The pump would be sourced on or before January 31, 2023.</p> <p>Compliance with final narrative water quality standards will be</p>	
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						<p>achieved on or before September 1, 2023.</p> <p>Additional monitoring at 31BR will be initiated for pH, DO, COD, BOU, TSS, NO-3, NO-2 NH3-N</p>	
<b>WV 1020579</b>	<p>Outlet 005 and Outlet 012</p> <p>Selenium and Conductivity</p> <p>Water management (pumping) will address both selenium and conductivity. A BCR unit has been permitted addition to water management.</p>	<p>Bioreactor</p> <p>Water management NPDES Bi-Monthly monitoring as specified in the NPDES permit.</p> <p>Internal Only Trendline Monitoring will utilize a 12- month rolling average end of pipe sampling and sampling at a point approximately 100 feet downstream.</p>	1	<p>NPDES Bi- Monthly monitoring as specified in the NPDES permit.</p> <p>Internal Only Trendline Monitoring will utilize a 12- month rolling average end of pipe sampling and sampling at a point approximately 100 feet downstream.</p>	See General Monitoring Criteria	<p>The North Biochemical Reactor System modified and approved in Modification 12 associated with Revision 16 as a part of Permit WV 1020579 for Outlets No. 005 and 012 has been permitted before September 6, 2022 and will be activated upon completion to address selenium issues at Outlets No. 005 and 012</p> <p>The North Biochemical Reactor System (“North BRS”) is to be constructed behind Fill 1. Earthwork will be completed by October 31, 2022. Sourcing of a mixed organic media containing any or all of the following; hay, sawdust, woodchips, mushroom compost, limestone chips, and molasses powder, must be sourced on or by November 30, 2022.</p>	<p>Proven Technology</p> <p>Bioreactors have been constructed at many mining sites. WVDEP developed criteria for bioreactors in 2013.”The West Virginia Department of Environmental Protection (DEP) finds that these structures can be successful in reducing the concentrations of the pollutants for which they are designed.” Permitting Guidance for Bioreactors Series 23 of the I&amp;E Handbook</p>

						<p>This BCR will be activated or before December 31, 2022 to address selenium issues at Outlet 019 The North BCR is designed to treat water from Pond 1 (Outlet 005) and Pond 6 (Outlet 0012. The water from Ponds 1 and 6 will be pumped to the North BRS treated then returned via pumping/gravity flow to Ponds 1 and 6 so that the hydraulics of the stream will remain the same.</p> <p>The BCR treated water will be aerated and polished in Ponds 1 and 6 to maintain compliance with downstream water quality monitored at Instream Monitoring Point 12BR and Instream Monitoring Point 005BR</p> <p>Compliance with final selenium limits is expected no later than September 1, 2023.</p> <p>In order to address conductivity, prior to pumping to the North BCR, the underdrain will be segregated and pumped to a retention pond. Earthwork associated with the</p>	
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						<p>retention pond will be completed January 31, 2023. The water from the retention pond will be pumped to provide irrigation for revegetation, dust suppression, etc.</p> <p>Compliance with final narrative water quality standards will be achieved on or before September 1, 2023.</p> <p>Additional monitoring at 005BR and 12BR will be initiated for pH, DO, COD, BOU, TSS, NO-3, NO-2 NH3-N</p>	
<b>WV 1020579</b>	Outlets No. 045 and 047	Bioreactor Water management	1	<p>NPDES Bi- Monthly monitoring as specified in the NPDES permit.</p> <p>Internal Only Trendline Monitoring will utilize a 12- month rolling average end of pipe sampling and sampling at a point approximately 100 feet downstream.</p>	See General Monitoring Criteria.	<p>South Biochemical Reactor System, modified and approved in Modification 12 associated with Revision 16, as a part of Permit WV 1020579 for Outlet No. 045 and 047 has been approved by WVDEP before September 6, 2022. Earthwork will be initiated construction will be completed before October 30, 2022 to address selenium issues at Outlets 45 and 47. Sourcing of a mixed organic media containing</p>	<p>Proven Technology</p> <p>Bioreactors have been constructed at many mining sites. WVDEP developed criteria for bioreactors in 2013.”The West Virginia Department of Environmental Protection (DEP) finds that these structures can be successful in reducing the</p>

						<p>any or all of the following; hay, sawdust, woodchips, mushroom compost, limestone chips, and molasses powder, must be sourced on or by December 31, 2022. This BRC will be activated or before January 31, 2023 to address selenium issues at Outlet 045 and Outlet 047. The South Biochemical Reactor System ("South BRS") is to be constructed at the back of Fill 2 and is designed to treat water from Pond 2 (Outlet 47) and Pond 3 (Outlet 45). The water from Ponds 2 and 3 will be pumped to the South BRS, treated then returned via pumping/gravity flow to Pond 2 and Pond 3 so that the hydraulics of the stream will remain the same. utilizing molasses powder in the medium as a nutritional boost to jump start the bioreactor process.</p> <p>The bioreactors will likely need an adjustment to the system for optimal performance. Adjustments, if any will</p>	<p>concentrations of the pollutants for which they are designed." Permitting Guidance for Bioreactors Series 23 of the I&amp;E Handbook</p>
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						<p>occur on or before March 31, 2023.</p> <p>Compliance with final selenium limits is expected no later than September 1, 2023.</p> <p>The BCR treated water will be aerated and polished in Ponds 1 and 6 to maintain compliance with downstream water quality monitored at Instream Monitoring Point 47BR and Instream Monitoring Point 45BR</p> <p>In order to address conductivity, prior to pumping to the South BRS, the Valley Fill 2 underdrain will be segregated and pumped to a retention pond. The water from the retention pond will be pumped to provide irrigation for revegetation, dust suppression, etc.</p> <p>Compliance with final narrative water quality standards will be achieved on or before September 1, 2023.</p> <p>Additional monitoring at 31BR will be initiated for pH, DO, COD, BOU, TSS, NO-3, NO-2 NH3-N</p>	
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<b>WV 1020579</b>	Outlet 001, 012,045,047, and 031  Selenium and Conductivity	Utilizing a retention pond Hold noncompliant bioreactor water Utilize Retention structures to Hold water; Release water in precip. events.	2**	NPDES Bi- Monthly monitoring as specified in the NPDES permit.  Internal Only Trendline Monitoring will utilize a 12- month rolling average sinstream sampling approximately 100 feet downstream of the discharge point.	See General Monitoring Criteria.	See General Pumping Timeline.  Phase 2 will be implemented if Phase 1's Trendline analysis is not a deemed a success.	Closed System  Dilution (If needed.)
<b>WV 1020579</b>	Outlet 001, 012,045,047, and 031  Selenium and Conductivity	Release Retention Pond water into mixing zone stream	3***	NPDES Bi- Monthly monitoring as specified in the NPDES permit.  Internal Only Trendline Monitoring will utilize a 12- month rolling average instream sampling at a point approximately 100 feet downstream. Of the discharge point.	See General Monitoring Criteria.	Phase 3 will be implemented if Phase 2's Trendline analysis is not a success.	EPA allows Mixing Zones. See A Compilation of EPA's Mixing Zone Documents at <a href="https://www.google.com/url?esrc=s&amp;q=&amp;rct=j&amp;sa=U&amp;url=https://www.epa.gov/site">https://www.google.com/url?esrc=s&amp;q=&amp;rct=j&amp;sa=U&amp;url=https://www.epa.gov/site</a>
<b>WV 1020579</b>	Outlet 001, 012,045,047, and 031  Selenium and Conductivity conductivity	Pumping Valley fill underdrain water. Utilize retention structures to hold water; release water in higher	1	NPDES Bi- Monthly monitoring as specified in the NPDES permit.  Internal Only Trendline Monitoring will utilize a 12- month rolling average instream sampling at a point	See General Monitoring Criteria.	See General Pumping Timeline.  Modification requiring regulatory approval will be submitted to the proper authorities within	Dilution (If needed.)

		precipitation events		approximately 100 feet downstream. Of the discharge point.		90 days of acceptance of this Treatment plan.	
<b>WV 1020579</b>	Outlet 001, 012,045,047, and 031  Selenium and Conductivity	Release retained pond water into mixing zone stream	2**	NPDES Bi- Monthly monitoring as specified in the NPDES permit.  Internal Only Trendline Monitoring will utilize a 12- month rolling average instream sampling at a point approximately 100 feet downstream. Of the discharge point.	See General Monitoring Criteria.	Phase 2 will be implemented if Phase 1's Trendline analysis is not a success.	See A Compilation of EPA's Mixing Zone Documents at <a href="https://www.google.com/url?esrc=s&amp;q=&amp;rct=j&amp;sa=U&amp;url=https://www.epa.gov/site">https://www.google.com/url?esrc=s&amp;q=&amp;rct=j&amp;sa=U&amp;url=https://www.epa.gov/site</a>
<b>WV 1020579</b>	Outlet 001, 012,045,047, and 031  Selenium and Conductivity	Diversion of surface water away from fill	3***	NPDES Bi- Monthly monitoring as specified in the NPDES permit.  Internal Only Trendline Monitoring will utilize a 12- month rolling monthly average instream sampling at a point approximately 100 feet downstream of the discharge point.	See General Monitoring Criteria.	Phase 3 will be implemented if Phase 2's Trendline analysis is not a success.	(If needed.)
<b>WV 1020579</b>	Outlet 001, 012,045,047, and 031  Selenium and	Compaction  Compact the top 2 foot fill layer to 90% proctor.	3***	NPDES Bi- Monthly monitoring as specified in the NPDES permit.	See General Monitoring Criteria.	Phase 3 will be implemented if Phase 2's Trendline analysis is not a success.	(If needed.)

	Conductivity			Internal Only Trendline Monitoring will utilize a 12- month rolling monthly average instream sampling at a point approximately 100 feet downstream. of the discharge point.			
<b>WV 1020579</b>	Outlet 001, 012,045,047, and 031  Selenium and Conductivity	Underground injection	3***	NPDES Bi- Monthly monitoring as specified in the NPDES permit.  Sample water to be injected at the point of underground entry.	There should be no surface flow to monitor because it should not exit if it will be monitored according to the NPDES permit.	Phase 3 will be considered if Phase 2's Trendline analysis is not a success.	(If needed.)
Interim limits will be added to each system within three months of the applicable system being constructed and activated. The trendline analysis is projected show a trend toward compliance within 6 months of sampling. A Detailed Sampling Report will be submitted to the court in the Monthly Report. The Detailed Sampling Report will contain Locations of sampling points, projections for sampling results, dates and results of actual samples.							

\* <https://www.powermag.com/stream-conductivity-its-not-just-a-mining-issue/>

\*\*Phase 2 will be implemented if Phase 1's Trendline analysis is not a success.

\*\*\*Phase 3 will be implemented if Phase 2's Trendline analysis is not a success.

**AFFIDAVIT OF KERMIT E. FINCHAM Jr. P.E. P. S.**  
**VICE PRESIDENT OF ENGINEERING, LEXINGTON COAL COMPANY, LLC**

Affiant, Kermit E. **Fincham Jr.** P.E. P. S. Vice President Of Engineering, Lexington Coal Company, LLC on behalf of Lexington Coal Company, LLC (“Lexington”) and in support of its Compliance with Court’s Memorandum Opinion and Order dated May 18, 2022 (the “Court’s Order”), and the attached treatment plan provides as follows::

1. I am employed with Lexington as its Vice President of Engineering.
2. I am a licensed Professional Engineer and a licensed Professional Surveyor in the State of West Virginia.
3. I have over twenty-five (25) years of experience working with water treatment technologies and over ten(10) years experience specifically related to selenium discharges.
4. I am knowledgeable about selenium issues and treatment.
5. I am knowledgeable about conductivity issues and treatment.
6. As such, I am authorized and qualified to provide this Affidavit and I have personal knowledge of the facts contained therein.
7. With regard to Item 2 of the Court’s Order: Achieve compliance no later than a year from the date of the plan’s submission I provide that compliance with selenium limits no later than a year from the date of the plan submission. To a reasonable degree of professional certainty, I provide that compliance with selenium limits will be achieved by September 1, 2023 through the installation of the Biochemical Reactor System.
8. With regard to Item 3 of the Court’s Order: Achieve compliance with West Virginia ionic pollution standards as soon as possible. To a reasonable degree of professional certainty, I provide that compliance with West Virginia ionic pollution standards will be achieved as soon as practicable in my professional judgment as well as through the use of various third-party environmental consultant.

9. With regard to Item 4 of the Court's Order: Include specific and enforceable interim milestones no longer than one year apart. Please review the GANNT chart that I reviewed and approved.
10. This Affidavit provides that to the best of my professional judgment compliance with the WVDEP approved selenium limits will be obtained within one year and ionic pollution restrictions will be met as soon as outlined in this Report.
11. I have had engineering oversight for systems construction and successful implementation involving two separate operations in the Appalachian region located in Boone County, West Virginia. Although due to my professional responsibility, the names of these sites must remain confidential, I personally worked as the professional engineer for over 25 years and I have implemented and overseen two such locations.
12. I helped create GANNT chart that is part of this Affidavit. Lexington shall submit monthly reports to both this Court and to the Plaintiffs describing its process and the plan moving forward.
13. Further the Affiant sayeth naught.



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**KERMIT E. FINCHAM Jr. P.E. P. S.**















Signature page for Remediation Plan

Kermit E. Fincham Jr. PE. P.S. \_\_\_\_\_

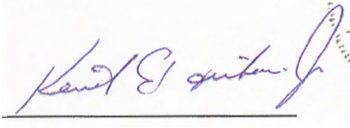
Lantz G. Rankin P.S 961SU

*Lantz G. Rankin*



Signature page for Remediation Plan

Kermit E. Fincham Jr. PE. P.S.



Lantz G. Rankin P.S 961SU

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## Heritage Technical Associates, Inc. – Company Overview

### Company History, 1996 to present:

Heritage Technical Associates, Inc. (“HTA”) began in 1996 as a small surveying and environmental consulting company working. Today, having survived and endured economic and regulatory threats to the coal industry, HTA continues to survive and thrive in Southern West Virginia. Benefitting from unmerited favor and blessings, the twelve employees of HTA strive to provide quality support services to coal and other economic endeavors in Southern West Virginia. While boundary surveying remains a small but valuable component of the services offered by HTA, environmental permitting is the main service provided by HTA. The following are recent project types prepared for various clients throughout Southern West Virginia:

- CWA 401 Stream impact authorizations (WVDEP)
- CWA 402 (WVNPDES) water discharge permits (WVDEP)
- CWA 404 Dredge and fill authorizations and associated Compensatory Mitigation Plans (Army Corps of Engineers)
- Army Corp of Engineers Stream Delineations
- SMCRA (Article 3) coal mine and reclamation permits
- Surveying to support mining and construction projects including mine face-ups, mine haulroads, WVDOH road construction, route surveys, highwall mining support, stockpile surveys, and other projects using conventional and drone techniques
- Macroinvertebrate studies
- Selenium treatment utilizing bioreactors
- Development and execution of stream restoration, enhancement, and establishment plans
- WVDEP (Article 4) quarry permits
- WVDEP AML no cost reclamation agreements

## Lantz G. Rankin - Curriculum Vitae / CV

### Career History , 1996 to present:

President and owner of Heritage Technical Associates, Inc. (formerly Heritage Surveying and Mapping, Inc.). Heritage Technical Associates, Inc. provides support to the private sector by assisting in obtaining the necessary environmental permits and authorizations needed to successfully operate in an environmentally sound manner. Services provided include surface modeling to determine effective mining ratios; navigating the regulatory requirements; executing plans for successful permitting, mining, and reclamation of surface and deep mines and reprocessing of abandoned refuse facilities; permit management and maintenance; and liaison with regulatory agencies (WVDEP, OSM, AML, WVNDPES, WVOWR, WVOWR, USFWS, WVSHPO) Services provided include boundary retracements and mapping support. Services provided for mining, gas, quarrying, industrial development and housing projects.

- 1995 to 1996  
Senior Environmental Engineer – Guyandotte Consultants, Inc., Logan, WV. Responsible for regulatory oversight of several mining operations in Logan, Mingo and Wayne Counties of WV.
- 1993 to 1995  
Environmental/Surface Mine Engineer – Heartland Coal, Harts, WV.

Responsible for environmental compliance for a surface mine operation.

- **1989 to 1993**

Advance Surveying and Mapping, Inc. – Logan, WV. Provided surveying and permitting services for coal mine projects as well as boundary retracements for various sized projects including procurement of surface and mineral in advance of a surface mine operation.

**Career Experience Relative to the WV Department of Environmental Protection**

- Heritage Technical Associates, Inc. provides services to assist the private sector in its dealings with the West Virginia Department of Environmental Protection ("WVDEP") and United States Army Corps of Engineers ("USACE") including:
  - WVNPDES Stormwater permits (both > and < 3 acres)
  - WVOWR – Individual Industrial Permits
  - WVNPDES Mining permits
  - Surface Mine Applications (Including both surface and deep mines)
  - Permit Revision Applications
  - Incidental Boundary Revision Applications
  - Permit Amendment Applications
  - Surface Mine Planning and Phasing
  - Drainage Structure Certification
  - Permit Release Applications
  - Planting and Reclamation Plans
  - Selenium treatment using bioreactors and water control structures
  - Preparation of CWA 404 and 401 certification applications
  - Delineation of waters under jurisdiction of the US
  - Preparation of USACE Compensatory Mitigation Plans
  - Stream Restoration Projects
  - Stream Creation Projects
  - Phase I Environmental Assessments

**Career Experience Relative to Boundaries and Retracements**

- Heritage Technical Associates, Inc. provides services assisting the private sector in retracements of boundaries and the establishment of flood elevations including:
  - Rural boundary retracements
  - Subdivisions
  - City lots
  - Topographic mapping
  - Global Positioning System surveys
  - Reports of Survey

**On-going or Recently Completed Projects**

- Heritage Technical Associates, Inc. provides services to assist clients in site construction and reclamation including the below on-going or recently completed project:
  - Ben's Creek Operations WV, LLC – Planning and permitting for a large surface mine in southern West Virginia
  - Prime Met, Inc. – Planning and permitting of two large surface mines in southern West Virginia
  - JMAC Leasing, Inc. – Planning and permitting of a large surface mine in southern West Virginia including the consideration of avoidance of selenium associated with adjacent surface mines of others and other ongoing selenium treatment using bioreactors and drainage control structures
  - Cline Group – Reclamation of two mine sites in WV and OH, including two preparation plant sites, two refuse facilities, two mine face-ups/slope, building removal, >2.5 miles of overland conveyor, multiple bore hole injection and pumping site, and a large water treatment facility

- Barnette Development, Inc. – The Appalachian Outpost – Assist in permitting and construction of an ATV resort facility to serve the Hatfield McCoy Trail System including 35 cabins and supporting infrastructure
- Devils Backbone Adventure Resort – Assist in permitting and construction of an ATV resort facility to serve the Hatfield McCoy Trail System including 44 cabins and 51 RV sites.

### **Professional and Educational Experience**

- Professional Surveyor, Licensed in WV (Surface and Underground) and Kentucky; formerly licensed in Alabama
- Associates of Science, Southern West Virginia Community and Technical College
- Past Instructor for the Surveying Program at Southern West Virginia Community and Technical College, Logan, WV
- Member of the Exam Writing Committee of the WV Board of Examiners of Professional Surveyors
- Member of WV Board of Examiners of Professional Surveyors; Chair of the Complaint Investigation Group
- Past President of WV Society of Professional Surveyors
- Advisory Board for Drafting Program, Boone Career and Technical Center, Danville, WV
- Testified in past as expert witness
- Undergraduate Concord College, Athens, WV
- Member of West Virginia Land and Mineral Owners Association's Coal Committee

### **Expert Witness Case History**

- Harrison County – Freeport v. Harrison County Coal
- Mingo County, WV – Cook v Cisco
- Logan County, WV – EQT v. Fountain Place
- Lincoln County, WV (Boundary dispute, name not recalled)
- Kanawha County, WV – OVEC v. Massey Energy
- Lincoln County, WV – Williamson v. Kruk, ROW dispute

### **Personal Details**

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